

REMARKS

Restriction/Election

The Examiner stated, as mentioned in the Requirement for Restriction/Election mailed September 30, 2005, that the finality of the rejection of the office action mailed June 17, 2005 has been withdrawn and prosecution on the merits of this application has been reopened.

The Examiner stated further, that in response to Applicants' arguments to the September 30, 2005 Restriction Requirement in the Appeal Brief filed December 1, 2005, said Restriction Requirement is hereby withdrawn because said arguments have been found persuasive.

Applicants appreciate withdrawal of the restriction requirement.

Claim Rejections - 35 USC §102

Claims 16-18, 6-8, 11-13, 15, 1-3, and 5 are rejected under 35 U.S.C. §102(e) as being anticipated by Chung et al. (U.S. Patent Application Publication No. 2004/0183180, hereinafter "Chung").

Referring to claim 16, the independent claim has been clarified to amend the previously claimed combination to now include the limitation that is not disclosed by Chung:

"a number of bonding wires electrically connecting the heat sink to the dies in the stack."

The support for the amendment is in Specification page 8, lines 17-18:

"A first ground wire 706 is connected between the second die 700 and the heat sink 600."

Referring to claim 17 and 18, these dependent claims respectively depend from independent claim 16 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations.

Referring to claim 6, the independent claim has been clarified to amend the previously claimed combination to now include the limitation that is not disclosed by Chung:

“the heat sink...electrically connected using a number of bonding wires to the stack of dies.” [deletion for clarity]

The support for the amendment is in Specification page 8, lines 17-18, above.

Referring to claim 7 and 8, these dependent claims respectively depend from independent claim 6 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations.

Referring to claim 11, the independent claim has been clarified to amend the previously claimed combination to now include the limitation that is not disclosed by Chung:

“a number of bonding wires electrically connecting the heat sink to the substrate.”

The support for the amendment is in Specification page 6, lines 10-11:

“Additionally, a third number of bonding wires 306 can be used between the heat sink 200 and the substrate 102 to conduct heat away from the heat sink 200 to the substrate 102.”

Referring to claim 12 and 13, these dependent claims respectively depend from independent claim 11 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations.

Referring to claim 1, the independent claim has been clarified to amend the previously claimed combination to now include the limitation that is not disclosed by Chung:

“a number of bonding wires electrically connecting the heat sink to the substrate.”

The support for the amendment is in Specification page 6, lines 10-11, above.

Referring to claim 2-3 and 5, these dependent claims respectively depend from independent claim 1 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations.

Based on the above, it is respectfully submitted that claims 1-3, 5, 6-8, 11-13, 15, and 16-18 are allowable under 35 U.S.C. §102(e) as not being anticipated by Chung because:

“Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration.” [underlining for clarity] W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing Soundsciber Corp. v. United States, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Carella v. Starlight Archery, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *modified on reh’g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Claim Rejections - 35 USC §103

Claims 20 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Patent Application Publication No. 2004/0183180, hereinafter “Chung”, the ‘180 reference).

Referring to claims 20 and 10, these dependent claims respectively depend from independent claim 16 and 6, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including, as exemplified in claim 20:

“a heat sink is positioned between each adjoining pair of dies in the stack of dies.”

It is respectfully submitted that the Examiner is correct in stating:

“[T]he reference does not disclose that a heat sink is positioned between each adjoining pair of dies in the stack of dies. In other words, the reference does not appear to teach stacking more than two dies wherein a heat sink is positioned between each adjoining pair of dies in the stack of dies.”

Chung teaches a substrate mounted chip supporter to carry a second chip in Chung para. [002] and all the FIGs.:

“This invention relates to a multi-chips stacked package. More particularly, the present invention is related to a multi-chips stacked package having a supporter to carry semiconductor chips.” [underlining for clarity]

Chung FIGs. 1 and 2 showing the prior art show dies positioned on top of each other, and Chung teaches away from this configuration by using a supporter mounted on a substrate. Thus, Chung teaches away from the Examiner’s conclusion:

“the addition of an element (a third or more die, another or more heat sink, as in the instant case) to a structure of two dies with a heat sink positioned between the pair of dies, which combination does not result in new or surprising function, involves only routine skill in the art and is not patentable.”

Chung teaches that the Applicants' invention would clearly be a new and surprising function since it eliminates the function of the supporter.

Based on the above, it is respectfully submitted that claims 10 and 20 are allowable under 35 U.S.C. §103(a) as being patentable over Chung because:

“We have noted elsewhere, as a “useful general rule,” that references that teach away cannot serve to create a prima facie case of obviousness... If references taken in combination would produce a “seemingly inoperative device”, we have held that such references teach away from the combination and thus cannot serve as predicates for a prima facie case of obviousness.” *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)[deletion for clarity]

Claims 19, 9, 14, and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Patent Application Publication No. 2004/0183180, hereinafter “Chung”, the ‘180 reference) in view of Shin et al. (U.S. Patent No. 5,854,511, hereinafter “Shin”, the ‘511 reference cited in a previous office action).

Regarding claims 19, 9, 14, and 4, these dependent claims respectively depend from independent claims 16, 6, 11, and 1, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim

additional unobvious combinations including Shin being directed to a semiconductor package that has only one semiconductor chip. The heat sink [20] is exposed through the molding compound [50]. An attempt to attach a second semiconductor chip to the exposed surface of the heat sink [20] would result in an inoperable device because a second semiconductor chip would be outside the semiconductor package. Applicants submit that a combination of references that results in an inoperable device, which would render the present invention unobvious under 35 U.S.C. §103 because of *In re Gordon, supra*.

The other references cited by the Examiner showing the prior art have been considered and are not believed to disclose, teach, or suggest, either singularly or in combination, Applicants' invention as claimed.

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-20 at an early date is solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,



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